Technical Assistance Services *for* Communities

West Lake Landfill Superfund Site

Fact Sheet #3 – May 2014

This fact sheet provides information about the 2011 Supplemental Feasibility Study Report for the West Lake Landfill Superfund site in Bridgeton, Missouri. Through the West Lake Landfill Community Advisory Group, the Technical Assistance Services for Communities (TASC) program is currently providing technical support to communities affected by the West Lake Landfill. This fact sheet is part of TASC's assistance.

Background

West Lake Landfill is located in the St. Louis metropolitan area on the east side of the Missouri River. The 200-acre area is about one mile north of the Interstate 70/270 interchange and four miles west of Lambert-St. Louis International Airport.

Limestone quarrying on site from 1939 until 1988 left behind two quarry pits. Beginning in the early 1950s, operators used parts of the quarried areas as a landfill for municipal, industrial and construction waste. Landfill operations ceased in 2005.

EPA divided the site into two areas, or operable units (OUs), for cleanup. OU1 addresses radiologically contaminated areas (Areas 1 and 2). OU2 addresses other landfill areas, including the Bridgeton Sanitary Landfill. This fact sheet focuses on OU1.

OU1 Cleanup

EPA selected the cleanup plan for OU1 – radiologically contaminated areas – in 2008. EPA selected the remedy in a decision document called a Record of Decision, or ROD. The remedy included covering the landfill, monitoring ground water, controlling surface water runoff and monitoring landfill gas. The ROD also called for land and resource use controls, long-term surveillance and maintenance. After the ROD completion, EPA directed the OU1 Respondents (the potentially responsible party group) to perform a Supplemental Feasibility Study (SFS) to further evaluate the ROD-selected remedy and two remedial alternatives that would remove radioactive material from the site. This decision was made as a result of internal EPA deliberations and comments by interested community members. Superfund regulations require EPA to consider nine criteria when deciding on a cleanup strategy. One criteria is community acceptance.

The two "complete rad removal" alternatives are:

1. Excavation of radioactive materials with off-site disposal of the excavated materials (referred to as the "complete rad removal with off-site disposal alternative" in the SFS Report).

2. Excavation of radioactive materials with on-site disposal of the materials in an engineered disposal cell with a liner and cap if there is a suitable location outside the floodplain (referred to as the "complete rad removal with on-site disposal" alternative in the SFS Report).

"Complete rad removal" according to the SFS means removal of radioactive materials to the extent that additional engineering and institutional controls would not be needed because of radioactive contamination. Controls at the site would still be needed to manage the solid waste left on-site.

The SFS Report is available at: http://www.epa.gov/region7/cleanup/west_lake_landfill/pdf/supplemental_feasibility_study-west_lake_landfill_ou-1.pdf

EPA accepted the final SFS Report in December 2011. Table 1 provides a summary of the three cleanup alternatives evaluated. Since completion of the SFS, EPA has ordered additional investigations, which may affect the analysis of cleanup alternatives and development of a revised cleanup plan for OU1.

Evaluation Criteria for Alternatives

The SFS evaluated the ROD-selected remedy and the two alternative remedies using seven of nine criteria set by a federal law, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).Two of the seven criteria are threshold criteria that must be satisfied:

- *Overall Protection of Human Health and the Environment.* Humans and organisms in the environment are protected from unsafe exposure to chemicals.

- *Compliance with Applicable or Relevant and Appropriate Requirements of Other Regulations (ARARs).* Cleanup goals have to follow state and federal guidelines.

The SFS found all three alternatives meet the first threshold criterion. The ROD-selected remedy and complete rad removal with off-site disposal both meet the second threshold criterion. The complete rad removal with on-site disposal would comply with most, but possibly not all ARARs. Putting the disposal cell in the landfill but outside of the floodplain requires locating the new disposal cell very close to the airport. This may be a problem; an agreement between the city and airport restricts activities that may increase the potential for bird interference with airport operations.

The evaluation also includes five primary balancing criteria:

- Long-term Effectiveness and Permanence
- Reduction of Toxicity, Mobility, or Volume (of chemicals) through Treatment
- Short-term Effectiveness
- Implementability
- Cost

The long-term risks associated with each of the cleanup alternatives are essentially the same. The remaining cancer risks posed by all three alternatives are below or within EPA's target risk range of 1 in a million to 1 in 10,000, meaning that there are 1 in a million to 1 in 10,000 extra cancers possible after the remedy is in place.

None of the cleanup alternatives includes treatment technologies that would reduce the toxicity, mobility or volume of the waste material through treatment. Treatment technologies are generally not applicable to solid waste landfills due to the large volume of wastes. For the radiologically impacted material (RIM) interspersed with the solid waste at the site, the radionuclides are naturally occurring elements that treatment cannot neutralize or destroy.

Short-term effectiveness includes an estimate of risk for the community and workers. During implementation of the remedy, the "complete rad removal" alternatives present a greater potential risk to both the community and site workers than the ROD-selected remedy. Greater risk to the community comes from proposed alternative cleanup activities, including a larger number of truck trips with potential for accidents, more greenhouse gas emissions and bigger noise and odor impacts. Greater risk to workers comes from the possibility of industrial accidents and larger and longer exposure to gamma radiation from the site materials. See Table 1 for risk estimates.

The SFS found the ROD-selected remedy to be easily implementable.

The SFS found the "complete rad removal with off-site disposal" alternative to have significant technical and administrative implementability issues. These issues included:

- Slower excavation rates and increased volume of RIM due to application of daily cover during the excavation
- Ability to construct an on-site rail spur and rail loading facility or lease a facility for truck-to-rail transfer
- Increased potential for aviation-bird strikes due to excavation of RIM contaminated solid waste and proximity of the site to the Lambert-St. Louis airport

- Ability to remove all of the RIM because some of the deeper RIM in Area 2 is close to adjacent landfill units
- Impacts to other site operations and possibly to local traffic from RIM transport operations

The SFS found the "complete rad removal with on-site disposal" alternative to have significant technical and administrative implementability issues. These issues include:

- Slower excavation rates and increased volume of RIM due to application of daily cover during the excavation
- Limited locations and areas for putting a new engineered landfill cell
- Uncertainty regarding the geologic conditions of the potential site for a new engineered landfill cell
- Uncertainty regarding the constructible size and volumetric capacity of a new engineered landfill cell
- Need for off-site handling of excess RIM or of mixed or liquid wastes encountered or created during excavation of RIM and placement of excavated waste in an on-site cell
- Increased potential for aviation-bird strikes due to excavation of RIM contaminated solid waste and placement in a new engineered cell located within the flight path of the Lambert-St. Louis airport
- Ability to remove all of the RIM because some of the deeper RIM in Area 2 is close to adjacent landfill units
- Intersection of the on-site haul route from Areas 1 and 2 to the on-site cell with the access road for the existing on-site solid waste transfer station and concrete and asphalt batch plants.

The "complete rad removal with off-site disposal" alternative has the highest estimated cost. The ROD-selected remedy has the lowest estimated cost. See Table 1 for cost estimates.

Cleanup Levels and Treatment Technologies

The SFS Report discusses the development of cleanup levels for "complete rad removal," which is 5 picocuries per gram (pCi/g) plus background level (the amount of a chemical found in nearby areas not affected by the site). Site cleanup values identified in the SFS Report are:

- Radium-226+228 = 7.9 pCi/g
- Thorium-230+232 = 7.9 pCi/g
- Total uranium = 54.5 pCi/g

Treatment technologies cannot destroy the radioactivity. Cleanup solutions must either remove and dispose of radioactive waste, or immobilize and isolate the radioactive material.

Table 1 shows the major components of the ROD-selected remedy and the two "complete rad removal" alternatives. All three cleanups also include:

- Air monitoring for radioactive materials during remedy construction (on-site and off-site.)
- Ground water monitoring (on site and off site)
- Surface water runoff controls
- Radon gas monitoring
- Institutional controls
- Long-term site surveillance and maintenance

Recently there has been a discovery of additional areas of probable RIM near the Transfer Station next to Area 1. If it is confirmed that additional RIM is present, calculated values, including cost, excavated volumes, and time to implement would likely be revised.

Modifying Criteria

Of the nine criteria for evaluating Superfund cleanup alternatives, the two remaining criteria are called modifying criteria. These are state and community acceptance. They are called modifying criteria because new information or comments from the state or the community may modify the preferred remedial action alternative or cause another alternative to be considered.

Table 1. Remedy Components, Short-term Effectiveness Elements and Cost

	Remedy Components	Material to be Moved	Short Term Cancer Risks Due to Cleanup	Greenhouse Gas Emissions	Timeline (approx.)	Cost
ROD-selected remedy, including additional performance standards identified in the SFS Report	• Landfill cover to meet Uranium Mill Tailings Radiation Control Act guidance for a 1,000-year design period, with additional thickness to prevent radiation emissions. • Excavation of radioactive waste from the Buffer Zone/Crossroads Property and consolidation in Areas 1 or 2. • Flood control measures for a 500-year storm event, assuming the existing levee system is breached.	*RIM:* 3,600 cubic yards from the Buffer Zone/Crossroads Property *Non-RIM:* 92,000-206,000 cubic yards to reduce existing landfill slope and allow for a perimeter access road and stormwater diversion ditch	*Community:* Cancer – less than 1 extra cancer case per 100,000 people *Workers:* Radiation dose – 50 milli-roentgen equivalent in man per year (mrem/yr) Cancer – less than 1 extra cancer case per 10,000 people	8,350 tons of carbon dioxide	3 years	*Construction:* $41 million *Annual operation and maintenance:* $42,000 – $414,000
Excavation of radioactive materials with off-site disposal	• Excavation and stockpiling of overburden in OU1 Areas 1 and 2 to access the RIM. • Excavation of RIM from Areas 1 and 2 and the Buffer Zone/Crossroads Property. • Loading, transport and disposal of the RIM and impacted soil at an off-site disposal facility (using rail transport, specifics not yet determined). • Regrading of remaining solid waste materials in Areas 1 and 2. • Installation of a landfill cover	*RIM:* 3,600 cubic yards from the Buffer Zone/Crossroads Property 33,500 cubic yards from Area 1 302,000 cubic yards from Area 2 *Non-RIM:* 49,000 cubic yards from Area 1 310,000 cubic yards from Area 2 (to access RIM material)	*Community:* Cancer – 2.1 extra cancer cases per 100,000 people *Workers:* Radiation dose – 260 mrem/yr Cancer – 7.6 extra cancer cases per 10,000 people	35,400 tons of carbon dioxide to the atmosphere	4 years	*Construction:* $259 – $415 million *Annual operation and maintenance:* $40,000 – $412,000

	Remedy Components	Material to be Moved	Short Term Cancer Risks Due to Cleanup	Greenhouse Gas Emissions	Timeline (approx.)	Cost
Excavation of radioactive material with on-site disposal	• Excavating soil from OU2 soil borrow and relocating it to the previously closed leachate lagoon. • Construction of a liner system for an on-site engineered disposal cell at the OU2 on-site soil borrow and stockpile area. • Excavation and stockpiling of overburden in OU1 Areas 1 and 2 to access the RIM. • Excavation of RIM from Areas 1 and 2 and the Buffer Zone/Crossroads Property. • Loading and transport of the RIM to the on-site engineering disposal cell. • Installation of a landfill cover. • Leachate monitoring and control for the on-site cell, as necessary.	*RIM:* 3,600 cubic yards from the Buffer Zone/Crossroads Property 33,500 cubic yards from Area 1 302,000 cubic yards from Area 2 *Non-RIM:* 49,000 cubic yards from Area 1 310,000 cubic yards from Area 2 (to access RIM material)	*Community:* Cancer – 2 extra cancer cases per 100,000 people *Workers:* Radiation dose – 260 mrem/yr Cancer – 7.4 extra cancer cases per 10,000 people	17,900 tons of carbon dioxide to the atmosphere	6 years	*Construction:* $117 million *Annual operation and maintenance:* $52,000 - $604,000